

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of:)	
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Wagner et al.)	
)	
Serial No.: 10/805,623)	Group Art Unit: 3733
)	
Filed: March 19, 2004)	Examiner: Jerry L. Cumberlandge
)	
For: BONE PLATE)	Board of Patent Appeals and
)	Interferences
)	

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APPEAL BRIEF UNDER 37 C.F.R. § 41.37

In support of the Notice of Appeal filed May 23, 2008, and pursuant to 37 C.F.R. § 41.37, Appellant presents this appeal brief in the above-captioned application.

This is an appeal to the Board of Patent Appeals and Interferences from the Examiner's final rejection of claims 1 - 52 and 66 - 163 in the Final Office Action dated January 24, 2008. The appealed claims are set forth in the attached Claims Appendix.

1. Real Party in Interest

This application is assigned to Synthes (U.S.A.) which is a wholly owned subsidiary of Synthes, Inc., the real party in interest.

2. Related Appeals and Interferences

There are no other appeals or interferences which would directly affect, be directly affected by, or have a bearing on the instant appeal.

3. Status of the Claims

Claims 53 - 65 and 164 - 176 have been withdrawn. Claims 1 - 52 and 66 - 163 have been rejected in the Final Office Action and are the subject of the present appeal.

4. Status of Amendments

All amendments submitted by the Appellant has been entered.

5. Summary of Claimed Subject Matter

The present invention describes, in one aspect, as recited in claim 1, a bone plate having a longitudinal axis 3 and comprising an upper surface 1, a lower surface 2, at least one first type of hole 4C and at least a second type of hole 4B. *Specification*, p. 2, ¶ [0025]; *see* Fig. 1. The first type of hole 4C is elongated, extending through the upper 1 and lower surfaces 2, and having a central axis and a longitudinal axis 3, wherein the first type of hole 4C includes a threaded portion 5 and a non-threaded portion, and the threaded portion 5 extends through an angle of between about 190° and about 280° with respect to the central axis thereof. *Id.* at p. 3, ¶ [0028] and ¶ [0029]; *see* Figs. 2, 4. The second type of hole 4B extends through the upper and lower

surfaces 1, 2, including an internal thread 5 configured and dimensioned for engaging a threaded portion 12 of a screw head 13. *Id.* at p. 3, ¶¶ [0027], [0031]; *see* Figs. 3, 5.

In another aspect, as recited in claim 27, the present invention describes a bone plate having a longitudinal axis 3 and comprising an upper surface 1, a lower surface 2, at least one first type of hole 4C and at least a second type of hole 4A. *Id.* at p. 2, ¶ [0025]; *see* Fig. 1. The first type of hole 4C is elongated, extending through the upper and lower surfaces 1, 2, respectively, and having a central axis and a longitudinal axis 3, wherein the first type of hole 4C includes a threaded portion 5 and a non-threaded portion and the threaded portion 5 extends through an angle of between about 190° and about 280° with respect to the central axis. *Id.* at p. 3, ¶¶ [0028], [0029]; *see* Figs. 2, 4. The second type of hole 4A extends through the upper 1 and lower surfaces 2, wherein the second type of hole 4A is substantially non-threaded. *Id.* at p. 3, ¶ [0026]; *see* Fig. 1.

In another aspect, as recited in claim 66, the present invention describes a bone plate having a longitudinal axis 3 and comprising an upper surface 1, a lower surface 2, at least one first type of hole 4A and at least a second type of elongated hole 4C. *Id.* at p. 2, ¶ [0025]; *see* Fig. 1. The first type of hole 4A extends through the upper 1 and lower surfaces 2, having a first central axis and being elongated in a direction substantially aligned with the longitudinal axis 3. *Id.* at p. 3, ¶ [0026]. The first type of hole 4A is non-threaded and has an outer perimeter, at least a portion of the outer perimeter tapering inward from the upper surface 1 to the lower surface 2 to form at least one ramp surface 6 for engagement with a first screw head. *Id.* The second type of elongated hole 4C extends through the upper 1 and lower surfaces 2, the second type of hole 4C having a second central axis and a longitudinal axis 3. *Id.* at p. 3, ¶¶ [0028], [0029]; *see* Figs. 2,

4. The second type of hole 4C includes a threaded portion 5 and a non-threaded portion, and the threaded portion 5 extends through an angle of between about 190° and about 280° with respect to the second central axis. *Id.*

In another aspect, as recited in claim 89, the present invention describes a bone plate having a longitudinal axis 3 and comprising an upper surface 1, a lower surface 2, at least one first type of hole 4C and at least a second type of hole 4B. *Id.* at p. 2, ¶ [0025]; *see* Fig. 1. The first type of hole 4C is elongated, extending through the upper and lower surfaces 1, 2, respectively, and having a central axis a longitudinal axis 3. *Id.* at p. 3, ¶¶ [0028], [0029]; *see* Figs. 2, 4. The first type of hole 4C is at least partially threaded and the threaded portion 5 of the hole 4C tapers inward with respect to the central axis. *Id.* The second type of hole 4B extends through the upper and lower surfaces 1, 2, respectively, and includes an internal thread 5 configured and dimensioned for engaging a threaded portion 12 of a screw head 13. *Id.* at p. 3, ¶¶ [0027], [0031]; *see* Figs. 4, 5.

In another aspect, as recited in claim 115, the present invention describes a bone plate having a longitudinal axis 3 and comprising an upper surface 1, a lower surface 2, at least one first type of hole 4C and at least a second type of hole 4A. *Id.* at p. 2, ¶ [0025]; *see* Fig. 1. The first type of hole 4C is elongated, extending through the upper and lower surfaces 1, 2, respectively, and having a central axis and a longitudinal axis 3, wherein the first type of hole 4C is at least partially threaded and the threaded portion 5 of the hole 4C tapers inward with respect to the central axis. *Id.* at p. 3, ¶¶ [0028], [0029]; *see* Figs. 2, 4. The second type of hole 4A extends through the upper 1 and lower surfaces 2, wherein the second type of hole 4A is substantially non-threaded. *Id.* at p. 3, ¶ [0026]; *see* Fig. 1.

In another aspect, as recited in claim 141, the present invention describes a bone plate having a longitudinal axis 3 and comprising an upper surface 1, a lower surface 2, at least one first type of hole 4A and at least a second type of elongated hole 4C. *Id.* at p. 2, ¶ [0025]; *see* Fig. 1. The first type of hole 4A extends through the upper and lower surfaces 1, 2, respectively, having a first central axis and being elongated in a direction substantially aligned with the longitudinal axis 3. *Id.* at p. 3, ¶ [0026]. The first type of hole 4A is non-threaded and has an outer perimeter, at least a portion of the outer perimeter tapering inward from the upper surface 1 to the lower surface 2 to form at least one ramp surface 6 for engagement with a first screw head. *Id.* The second type of elongated hole 4C extends through the upper and lower surfaces 1, 2, respectively, the second type of hole 4C having a second central axis and a longitudinal axis 3, wherein the hole 4C is at least partially threaded and the threaded portion 5 of the hole 4C tapers inward with respect to the second central axis. *Id.* at p. 3, ¶¶ [0028], [0029]; *see* Figs. 2, 4.

6. Grounds of Rejection to be Reviewed on Appeal

- I. Whether claims 115 and 141 are unpatentable under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,709,686 to Talos et al. (hereinafter “Talos”).
- II. Whether claims 1 - 52, 66 - 114, 116 - 140 and 142 - 163 are unpatentable under 35 U.S.C. § 103(a) as obvious over Talos.

7. Argument

- I. The Rejection of Claims 115 and 141 Under 35 U.S.C. § 102(b) as Anticipated by Talos Should be Reversed

A. The Examiner's Rejection

In the Final Office Action, the Examiner rejected claims 115 and 141 under 35 U.S.C. §

102(b) as anticipated by Talos. 1/24/08 Office Action, p. 2.

B. Talos Does Not Show or Suggest at Least a Portion
of a Hole That Tapers Inward With Respect to a
Central Axis as Recited in Claims 115 and 141

Claim 115 recites a bone plate having a longitudinal axis and comprising “an upper surface” and “a lower surface” in combination with “at least one first type of hole, the first type of hole being elongated and extending through the upper and lower surfaces, and having a central axis and a longitudinal axis, wherein the first type of hole is at least partially threaded and *the threaded portion of the hole tapers inward with respect to the central axis*” and “at least a second type of hole extending through the upper and lower surfaces, wherein the second type of hole is substantially non-threaded.”

In contrast, Talos discloses a bone plate comprising a hole with a lower part that is partially threaded. The non-threaded portions of the lower parts of the holes of Talos flare outward relative to the central axis. However, the threaded portions of the holes of Talos do not flare or taper in any way. Specifically, an upper tapered part of each hole of Talos is entirely unthreaded. The lower part of each hole includes discontinuous threading – i.e., threaded portions each of which comprises a part of a circumference of the hole and which are separated from one another by non-threaded portions. The flare in this lower part is exclusively in the non-threaded portions. See *Talos*, col. 2, ll. 29 - 44. The holes 2 are elongated with flared portions of the lower parts of the holes 2 facing the bone and aligned with one another along the longitudinal axis of the plate. This arrangement allows non-locking screws (i.e., screws with no threading on their heads) to be inserted through the plate at any angle within a range permitted by the flaring of the holes 2. As shown in Fig. 5, locking screws may be engaged with the threaded

portions of the holes 2 only parallel to the central axes of the holes 2. In fact, tapering the threaded parts of the holes 2 would prevent the cylindrical threaded head of the screw of Fig. 5 from engaging the hole 2 as desired. (*See*, Fig. 5).

The Examiner contends that the hole 2 is comparable the first hole of the recited claim. *1/24/08 Office Action*, p. 2. Specifically, the Examiner contends that the threaded portion of the hole 2 must taper since the screw 7, shown in Fig. 7, creates a slight taper. *Id.* It is respectfully submitted, however, that the threaded portion 3 of the hole 2 does not taper and that the head 8 of the screw 7 is not threaded. Nor is the head of the screw 7 intended to engage with the threaded portion 3 of the hole 2. In fact, such engagement would prevent the angling of the screw 7 shown in Figs. 6 and 7 and frustrate the purpose of the invention. The upper portion of the head 8 of the screw 7 slidingly engages the upper countersink part of the hole 2 while the portion of the head 8 received in the lower part of the hole 2 does not even contact the sides of the hole 2. *Talos* Figs. 6 and 7; col. 2, ll. 51 - 54. As described above, the threaded portion 3 of the holes 2 is not tapered in any way. This is necessary to engage the threaded head 9 of the screw 6 which is similarly non-tapered. Fig. 7 shows a cross-section of the lower portion of hole 2 with sides of the threaded portion 3 extending straight and parallel to one another – i.e., without flaring in any way. Moreover, it is respectfully submitted that since the non-threaded portions of the lower part of hole 2 are explicitly described as flaring along the longitudinal axis, the lack of any description or suggestion of such a flaring or tapering in other parts of the holes 2 confirms that they are not tapered.

Thus, it is respectfully submitted that *Talos* does not show or suggest “a first type of hole is at least partially threaded and *the threaded portion of the hole tapers inward with respect to*

the central axis,” as recited in claim 115. Accordingly, it is respectfully submitted that claim 115 is not anticipated by Talos and that the final rejection of this claim should be reversed.

Similarly, claim 141 recites a bone plate having a longitudinal axis and comprising “an upper surface” and “a lower surface” in combination with “at least one first type of hole extending through the upper and lower surfaces, and having a first central axis and being elongated in a direction substantially aligned with the longitudinal axis, wherein the first type of hole is non-threaded and has an outer perimeter, at least a portion of the outer perimeter tapering inward from the upper surface to the lower surface to form at least one ramp surface for engagement with a first screw head” and “at least a second type of elongated hole extending through the upper and lower surfaces, the second type of hole having a second central axis and a longitudinal axis, wherein the hole is at least partially threaded and *the threaded portion of the hole tapers inward with respect to the second central axis.*”

For at least the same reasons as discussed above in regard to claim 115, it is respectfully submitted that claim 141 is not anticipated by Talos and that the final rejection of this claim should be reversed.

II. The Rejection of Claims 1- 52, 66 - 114, 116 - 140 and 142 - 163
Under 35 U.S.C. § 103(a) as Obvious Over Talos Should be
Reversed

A. The Examiner's Rejection

In the Final Office Action, the Examiner rejected claims 1- 52, 66 - 114, 116 - 140 and 142 - 163 under 35 U.S.C. 103(a) as obvious over Talos. *1/24/08 Office Action*, p. 3.

B. Talos Does not Teach or Suggest a Threaded Portion That is Tapered or That Extends Through an Angle Between 190° and 280° as Recited in Independent Claims 1, 27, 66, 89, 115 and 141

Claim 1 recites a bone plate having a longitudinal axis and comprising “an upper surface” and “a lower surface” in combination with “at least one first type of hole, the first type of hole being elongated and extending through the upper and lower surfaces, and having a central axis and a longitudinal axis, wherein the first type of hole includes a threaded portion and a non-threaded portion, and *the threaded portion extends through an angle of between about 190° and about 280° with respect to the central axis*” and “at least a second type of hole extending through the upper and lower surfaces, the second type of hole including an internal thread configured and dimensioned for engaging a threaded portion of a screw head.”

The Examiner states that Talos discloses the invention substantially as claimed except for an angle of between 190 degrees and 280 degrees, but states that it would have been obvious to one of ordinary skill in the art to vary the angle of threading of the hole of Talos. *1/24/08 Office Action*, pp. 7-8.

It is respectfully submitted, however, that Talos specifically teaches that the lower portion of the hole 2 as threaded only along the circular portion that is not flared outwardly. *See Id.* at col. 2, ll. 40-44. Indeed, Talos specifically teaches that because of design constraints, the thread 3 only runs over an angular range of 60 degrees to 179 degrees, but preferably about 90 degrees to 150 degrees. *Id.* at col. 2, ll. 39-44. Since the flared portion of the hole 2 is explicitly taught as non-threaded, the threaded portion 3 can inherently only extend at an angle smaller than 180 degrees – any more than this and it would not be possible to angle the screw 7 as shown in Figs. 6 and 7. Thus, it is respectfully submitted that it would not have been obvious to one of

ordinary skill in the art to modify the hole of Talos such that “*the threaded portion extends through an angle of between about 190° and about 280° with respect to the central axis,*” as recited in claim 1.

Accordingly, it is respectfully submitted that claim 1 is not rendered obvious by Talos and that the final rejection of this claim should be reversed. Because claims 2 - 26 depend from and include all of the limitations of claim 1, it is respectfully submitted that these claims are also allowable.

Similarly, claim 27 recites a bone plate having a longitudinal axis and comprising “an upper surface” and “a lower surface” in combination with “at least one first type of hole, the first type of hole being elongated and extending through the upper and lower surfaces, and having a central axis and a longitudinal axis, wherein the first type of hole includes a threaded portion and a non-threaded portion, and *the threaded portion extends through an angle of between about 190° and about 280° with respect to the central axis*” and “at least a second type of hole extending through the upper and lower surfaces, wherein the second type of hole is substantially non-threaded.”

For at least the same reasons as discussed above in regard to claim 1, it is respectfully submitted that claim 27 is not rendered obvious by Talos and that the final rejection of this claim should be withdrawn. Because claims 28 - 52 depend from and include all of the limitations of this claim, it is respectfully submitted that this claim is also allowable.

Claim 66 recites a bone plate having a longitudinal axis and comprising “an upper

surface” and “a lower surface” in combination with “at least one first type of hole extending through the upper and lower surfaces, and having a first central axis and being elongated in a direction substantially aligned with the longitudinal axis, wherein the first type of hole is non-threaded and has an outer perimeter, at least a portion of the outer perimeter tapering inward from the upper surface to the lower surface to form at least one ramp surface for engagement with a first screw head” and “at least a second type of elongated hole extending through the upper and lower surfaces, the second type of hole having a second central axis and a longitudinal axis, wherein the second type of hole includes a threaded portion and a non-threaded portion, and *the threaded portion extends through an angle of between about 190° and about 280° with respect to the second central axis.*”

For at least the same reasons as discussed above in regard to claim 1, it is respectfully submitted that claim 66 is not rendered obvious by Talos and that the final rejection of this claim should be reversed. Because claims 67 - 88 depend from and include all of the limitations of claim 66, it is respectfully submitted that these claims are also allowable.

Claim 89 recites a bone plate having a longitudinal axis and comprising “an upper surface” and “a lower surface” in combination with “at least one first type of hole, the first type of hole being elongated and extending through the upper and lower surfaces, and having a central axis a longitudinal axis, wherein the first type of hole is at least partially threaded and *the threaded portion of the hole tapers inward with respect to the central axis*” and “at least a second type of hole extending through the upper and lower surfaces, the second type of hole including an internal thread configured and dimensioned for engaging a threaded portion of a screw head.”

For at least the same reasons as discussed above in regard to claim 115, it is respectfully submitted that claim 89 is not rendered obvious by Talos and that the final rejection of this claim should be reversed. Because claims 90 - 114 depend from and include all of the limitations of claim 89, it is respectfully submitted that these claims are also allowable.

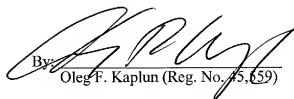
As discussed above in regard to the § 102(b) above, it is respectfully submitted that claims 115 and 141 are allowable over Talos. Since claims 116 - 140 and 142 - 163 depend from and include all of the limitations of claim 115 and 141, respectively, it is respectfully submitted that these claims are also allowable and that the final rejection of these claims should be reversed.

8. Conclusion

For the reasons set forth above, Appellant respectfully requests that the Board reverse the final rejections of the claims by the Examiner under 35 U.S.C. § 102(b) and 35 U.S.C. § 103(a) and indicate that claims 1 - 52 and 66 - 163 are allowable.

Respectfully submitted,

Date: August 21, 2008

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CLAIMS APPENDIX

1. (Original) A bone plate having a longitudinal axis and comprising:

an upper surface;

a lower surface;

at least one first type of hole, the first type of hole being elongated and extending through the upper and lower surfaces, and having a central axis and a longitudinal axis, wherein the first type of hole includes a threaded portion and a non-threaded portion, and the threaded portion extends through an angle of between about 190° and about 280° with respect to the central axis; and

at least a second type of hole extending through the upper and lower surfaces, the second type of hole including an internal thread configured and dimensioned for engaging a threaded portion of a screw head.

2. (Original) The bone plate of claim 1, wherein the plate comprises a plurality of holes of the first type and a plurality of holes of the second type.

3. (Original) The bone plate of claim 2, wherein the plurality of holes of the first type are located closer to a first end of the plate and the plurality of holes of the second type are located closer to a second end of the plate.

4. (Original) The bone plate of claim 1, wherein the longitudinal axis of at least one of the first type of hole is substantially aligned with the longitudinal axis of the plate.

5. (Original) The bone plate of claim 1, wherein the second type of hole has an outer perimeter that is substantially circular.
6. (Original) The bone plate of claim 5, wherein the second type of hole is conically tapered inward from the upper surface towards the lower surface of the plate.
7. (Original) The bone plate of claim 6, wherein the second type of hole conically tapers at a cone angle of between about 5° and about 20°.
8. (Original) The bone plate of claim 6, further comprising at least a third type of hole extending through the upper and lower surfaces, wherein the third type of hole is substantially non-threaded.
9. (Original) The bone plate of claim 8, wherein a plurality of holes of the first type and at least one hole of the second type or third type is located closer to a first end of the plate and a plurality of holes of at least the second type are located closer to a second end of the plate.
10. (Original) The bone plate of claim 5, wherein the second type of hole has a first opening on the upper surface of the bone plate and a second opening on the bottom surface of the bone plate, and the first and second openings have substantially the same dimensions.
11. (Original) The bone plate of claim 10, further comprising at least a third type of hole extending through the upper and lower surfaces, wherein the third type of hole is substantially non-threaded.

12. (Original) The bone plate of claim 11, wherein a plurality of holes of the first type and at least one hole of the second type or third type is located closer to a first end of the plate and a plurality of holes of at least the second type are located closer to a second end of the plate.

13. (Original) The bone plate of claim 1, wherein the threaded portion of the first type of hole extends through an angle of between about 200° and about 250° with respect to the central axis.

14. (Original) The bone plate of claim 1, wherein: the threaded portion of the first type of hole extends through a first angle at the upper surface; the threaded portion of the first type of hole extends through a second angle at the lower surface; and the first angle is larger than the second angle.

15. (Original) The bone plate of claim 14, wherein the first angle is between about 200° and about 270°, and the second angle is between about 180° and about 230°.

16. (Original) The bone plate of claim 1, wherein the first type of hole has first and second ends spaced apart along the longitudinal axis, and the threaded portion is disposed adjacent one of the ends.

17. (Original) The bone plate of claim 1, wherein the threaded portion of the first type of hole is located closer to a central portion of the bone plate than to an end portion of the bone plate.

18. (Original) The bone plate of claim 1, wherein the non-threaded portion of the first type of

hole is configured and dimensioned to engage a substantially spherical screw head and provide compression of fractured bone fragments.

19. (Original) The bone plate of claim 18, further including a screw having a head, wherein the screw head is substantially smooth.

20. (Original) The bone plate of claim 18, further including a screw having a head, wherein the screw head is at least partially threaded.

21. (Original) The bone plate of claim 1, wherein the non-threaded portion of the first type of hole includes a concave recessed portion in the upper surface.

22. (Original) The bone plate of claim 21, wherein the recessed portion is substantially spherical.

23. (Original) The bone plate of claim 1, wherein: the first type of hole has a first dimension on the lower surface that is substantially parallel to the longitudinal axis; the first type of hole has a second dimension on the lower surface that is substantially perpendicular to the longitudinal axis; and the first dimension is between 1.1 and 3 times larger than the second dimension.

24. (Original) The bone plate of claim 1, wherein the threaded portion of the first type of hole tapers inward in a direction from the upper surface towards the lower surface.

25. (Original) The bone plate of claim 1, wherein at least a portion of the non-threaded portion of the first type of hole tapers inward from the upper surface to the lower surface to form at least

one ramp surface for engagement with a screw head.

26. (Original) The bone plate of claim 25, wherein the ramp surface is located on one end of the first type of hole to provide compression in a single direction.

27. (Original) A bone plate having a longitudinal axis and comprising:

an upper surface;

a lower surface;

at least one first type of hole, the first type of hole being elongated and extending through the upper and lower surfaces, and having a central axis and a longitudinal axis, wherein the first type of hole includes a threaded portion and a non-threaded portion, and the threaded portion extends through an angle of between about 190° and about 280° with respect to the central axis; and

at least a second type of hole extending through the upper and lower surfaces, wherein the second type of hole is substantially non-threaded.

28. (Original) The bone plate of claim 27, wherein the plate comprises a plurality of holes of the first type and a plurality of holes of the second type.

29. (Original) The bone plate of claim 28, wherein the plurality of holes of the first type are located closer to a first end of the plate and the plurality of holes of the second type are located closer to a second end of the plate.

30. (Original) The bone plate of claim 27, wherein the longitudinal axis of at least one of the first

type of hole is substantially aligned with the longitudinal axis of the plate.

31. (Original) The bone plate of claim 27, wherein the second type of hole has an outer perimeter that is substantially circular.

32. (Original) The bone plate of claim 31, wherein the second type of hole is conically tapered inward from the upper surface towards the lower surface of the plate.

33. (Original) The bone plate of claim 32, wherein the second type of hole conically tapers at a cone angle of between about 5° and about 20°.

34. (Original) The bone plate of claim 32, further comprising at least a third type of hole extending through the upper and lower surfaces, wherein the third type of hole includes an internal thread configured and dimensioned for engaging a threaded portion of a screw head.

35. (Original) The bone plate of claim 34, wherein a plurality of holes of the first type and at least one hole of the second type or third type is located closer to a first end of the plate and a plurality of holes of at least the third type are located closer to a second end of the plate.

36. (Original) The bone plate of claim 31, wherein the second type of hole has a first opening on the upper surface of the bone plate and a second opening on the bottom surface of the bone plate, and the first and second openings have substantially the same dimensions.

37. (Original) The bone plate of claim 36, further comprising at least a third type of hole

extending through the upper and lower surfaces, wherein the third type of hole includes an internal thread configured and dimensioned for engaging a threaded portion of a screw head.

38. (Original) The bone plate of claim 37, wherein a plurality of holes of the first type and at least one hole of the second type or third type is located closer to a first end of the plate and a plurality of holes of at least the third type are located closer to a second end of the plate.

39. (Original) The bone plate of claim 27, wherein the threaded portion of the first type of hole extends through an angle of between about 200° and about 250° with respect to the central axis.

40. (Original) The bone plate of claim 27, wherein: the threaded portion of the first type of hole extends through a first angle at the upper surface; the threaded portion of the first type of hole extends through a second angle at the lower surface; and the first angle is larger than the second angle.

41. (Original) The bone plate of claim 40, wherein the first angle is between about 200° and about 270°, and the second angle is between about 180° and about 230°.

42. (Original) The bone plate of claim 27, wherein the first type of hole has first and second ends spaced apart along the longitudinal axis, and the threaded portion is disposed adjacent one of the ends.

43. (Original) The bone plate of claim 27, wherein the threaded portion of the first type of hole is located closer to a central portion of the bone plate than to an end portion of the bone plate.

44. (Original) The bone plate of claim 27, wherein the non-threaded portion of the first type of hole is configured and dimensioned to engage a substantially spherical screw head and provide compression of fractured bone fragments.

45. (Original) The bone plate of claim 44, further including a screw having a head, wherein the screw head is substantially smooth.

46. (Original) The bone plate of claim 44, further including a screw having a head, wherein the screw head is at least partially threaded.

47. (Original) The bone plate of claim 27, wherein the non-threaded portion of the first type of hole includes a concave recessed portion in the upper surface.

48. (Original) The bone plate of claim 47, wherein the recessed portion is substantially spherical.

49. (Original) The bone plate of claim 27, wherein: the first type of hole has a first dimension on the lower surface that is substantially parallel to the longitudinal axis; the first type of hole has a second dimension on the lower surface that is substantially perpendicular to the longitudinal axis; and the first dimension is between 1.1 and 3 times larger than the second dimension.

50. (Original) The bone plate of claim 27, wherein the threaded portion of the first type of hole tapers inward in a direction from the upper surface towards the lower surface.

51. (Original) The bone plate of claim 27, wherein at least a portion of the non-threaded portion of the first type of hole tapers inward from the upper surface to the lower surface to form at least one ramp surface for engagement with a screw head.

52. (Original) The bone plate of claim 51, wherein the ramp surface is located on one end of the first type of hole to provide compression in a single direction.

53. (Withdrawn) A bone plate having a longitudinal axis and comprising:

an upper surface;

a lower surface;

at least one first type of hole, the first type of hole being elongated and extending through the upper and lower surfaces, and having a central axis and a longitudinal axis, wherein the first type of hole is non-threaded and has an outer perimeter, at least a portion of the outer perimeter tapering inward from the upper surface to the lower surface to form at least one ramp surface for engagement with a first screw head; and

at least a second type of hole extending through the upper and lower surfaces, the second type of hole including an internal thread configured and dimensioned for engaging a threaded portion of a second screw head.

54. (Withdrawn) The bone plate of claim 53, wherein the plate comprises a plurality of holes of the first type and a plurality of holes of the second type.

55. (Withdrawn) The bone plate of claim 54, wherein the plurality of holes of the first type are located closer to a first end of the plate and the plurality of holes of the second type are located

closer to a second end of the plate.

56. (Withdrawn) The bone plate of claim 53, wherein the longitudinal axis of at least one of the first type of hole is substantially aligned with the longitudinal axis of the plate.

57. (Withdrawn) The bone plate of claim 53, wherein the second type of hole has an outer perimeter that is substantially circular.

58. (Withdrawn) The bone plate of claim 57, wherein the ramp surface is located on one end of the elongated first type of hole to provide compression in a single direction.

59. (Withdrawn) The bone plate of claim 57, wherein the second type of hole is conically tapered inward from the upper surface towards the lower surface of the plate.

60. (Withdrawn) The bone plate of claim 59, wherein the second type of hole conically tapers at a cone angle of between about 5° and about 20° .

61. (Withdrawn) The bone plate of claim 59, further comprising at least a third type of hole extending through the upper and lower surfaces, wherein the third type of hole is substantially non-threaded.

62. (Withdrawn) The bone plate of claim 61, wherein a plurality of holes of the first type and at least one hole of the second type or third type is located closer to a first end of the plate and a plurality of holes of at least the second type are located closer to a second end of the plate.

63. (Withdrawn) The bone plate of claim 57, wherein the second type of hole has a first opening on the upper surface of the bone plate and a second opening on the bottom surface of the bone plate, and the first and second openings have substantially the same dimensions.

64. (Withdrawn) The bone plate of claim 63, further comprising at least a third type of hole extending through the upper and lower surfaces, wherein the third type of hole is substantially non-threaded.

65. (Withdrawn) The bone plate of claim 64, wherein a plurality of holes of the first type and at least one hole of the second type or third type is located closer to a first end of the plate and a plurality of holes of at least the second type are located closer to a second end of the plate.

66. (Original) A bone plate having a longitudinal axis and comprising:

- an upper surface;

- a lower surface;

- at least one first type of hole extending through the upper and lower surfaces, and having a first central axis and being elongated in a direction substantially aligned with the longitudinal axis, wherein the first type of hole is non-threaded and has an outer perimeter, at least a portion of the outer perimeter tapering inward from the upper surface to the lower surface to form at least one ramp surface for engagement with a first screw head; and

- at least a second type of elongated hole extending through the upper and lower surfaces, the second type of hole having a second central axis and a longitudinal axis, wherein the second type of hole includes a threaded portion and a non-threaded portion, and the threaded portion

extends through an angle of between about 190° and about 280° with respect to the second central axis.

67. (Original) The bone plate of claim 66, wherein the plate comprises a plurality of holes of the first type and a plurality of holes of the second type.

68. (Original) The bone plate of claim 66, wherein the longitudinal axis of the second type of hole is substantially aligned with the longitudinal axis of the plate.

69. (Original) The bone plate of claim 66, further comprising at least a third type of hole extending through the upper and lower surfaces, wherein the third type of hole is substantially non-threaded.

70. (Original) The bone plate of claim 69, wherein a plurality of holes of the first type and at least one hole of the second type or third type is located closer to a first end of the plate and a plurality of holes of at least the second type are located closer to a second end of the plate.

71. (Original) The bone plate of claim 66, further comprising at least a third type of hole extending through the upper and lower surfaces, wherein the third type of hole includes an internal thread configured and dimensioned for engaging a threaded portion of a screw head.

72. (Original) The bone plate of claim 71, wherein a plurality of holes of the first type and at least one hole of the second type or third type is located closer to a first end of the plate and a plurality of holes of at least the third type are located closer to a second end of the plate.

73. (Original) The bone plate of claim 66, wherein the threaded portion of the second type of hole extends through an angle of between about 200° and about 250° with respect to the central axis.

74. (Original) The bone plate of claim 66, wherein: the threaded portion of the second type of hole extends through a first angle at the upper surface; the threaded portion of the second type of hole extends through a second angle at the lower surface; and the first angle is larger than the second angle.

75. (Original) The bone plate of claim 74, wherein the first angle is between about 200° and about 270° , and the second angle is between about 180° and about 230° .

76. (Original) The bone plate of claim 66, wherein the second type of hole has first and second ends spaced apart along the longitudinal axis, and the threaded portion is disposed adjacent one of the ends.

77. (Original) The bone plate of claim 66, wherein the threaded portion of the second type of hole is located closer to a central portion of the bone plate than to an end portion of the bone plate.

78. (Original) The bone plate of claim 66, wherein the non-threaded portion of the second type of hole is configured and dimensioned to engage a substantially spherical screw head and provide compression of fractured bone fragments.

79. (Original) The bone plate of claim 78, further including a screw having a head, wherein the screw head is substantially smooth.

80. (Original) The bone plate of claim 78, further including a screw having a head, wherein the screw head is at least partially threaded.

81. (Original) The bone plate of claim 66, wherein the non-threaded portion of the second type of hole includes a concave recessed portion in the upper surface.

82. (Original) The bone plate of claim 81, wherein the recessed portion is substantially spherical.

83. (Original) The bone plate of claim 66, wherein: the second type of hole has a first dimension on the lower surface that is substantially parallel to the longitudinal axis; the second type of hole has a second dimension on the lower surface that is substantially perpendicular to the longitudinal axis; and the first dimension is between 1.1 and 3 times larger than the second dimension.

84. (Original) The bone plate of claim 66, wherein the threaded portion of the second type of hole tapers inward in a direction from the upper surface towards the lower surface.

85. (Original) The bone plate of claim 84, wherein the threaded portion of the second type of hole conically tapers at a cone angle of between about 5° and about 20°.

86. (Original) The bone plate of claim 66, wherein the first central axis of the first type of hole is located closer to a first end of the bone plate and the second central axis of the second type of hole is located closer to a second end of the bone plate.

87. (Original) The bone plate of claim 66, wherein at least a portion of the non-threaded portion of the second type of hole tapers inward from the upper surface to the lower surface to form at least one ramp surface for engagement with a screw head.

88. (Original) The bone plate of claim 87, wherein the ramp surface is located on one end of the second type of hole to provide compression in a single direction.

89. (Original) A bone plate having a longitudinal axis and comprising:

- an upper surface;

- a lower surface; and

- at least one first type of hole, the first type of hole being elongated and extending through the upper and lower surfaces, and having a central axis a longitudinal axis, wherein the first type of hole is at least partially threaded and the threaded portion of the hole tapers inward with respect to the central axis; and

- at least a second type of hole extending through the upper and lower surfaces, the second type of hole including an internal thread configured and dimensioned for engaging a threaded portion of a screw head.

90. (Original) The bone plate of claim 89, wherein the plate comprises a plurality of holes of the first type and a plurality of holes of the second type.

91. (Original) The bone plate of claim 90, wherein the plurality of holes of the first type are located closer to a first end of the plate and the plurality of holes of the second type are located closer to a second end of the plate.

92. (Original) The bone plate of claim 89, wherein the longitudinal axis of at least one of the first type of hole is substantially aligned with the longitudinal axis of the plate.

93. (Original) The bone plate of claim 89, wherein the second type of hole has an outer perimeter that is substantially circular.

94. (Original) The bone plate of claim 93, wherein the second type of hole is conically tapered inward from the upper surface towards the lower surface of the plate.

95. (Original) The bone plate of claim 94, wherein the second type of hole conically tapers at a cone angle of between about 5° and about 20°.

96. (Original) The bone plate of claim 93, further comprising at least a third type of hole extending through the upper and lower surfaces, wherein the third type of hole is substantially non-threaded.

97. (Original) The bone plate of claim 93, wherein a plurality of holes of the first type and at least one hole of the second type or third type is located closer to a first end of the plate and a plurality of holes of at least the second type are located closer to a second end of the plate.

98. (Original) The bone plate of claim 93, wherein the second type of hole has a first opening on the upper surface of the bone plate and a second opening on the bottom surface of the bone plate, and the first and second openings have substantially the same dimensions.

99. (Original) The bone plate of claim 98, further comprising at least a third type of hole extending through the upper and lower surfaces, wherein the third type of hole is substantially non-threaded.

100. (Original) The bone plate of claim 99, wherein a plurality of holes of the first type and at least one hole of the second type or third type is located closer to a first end of the plate and a plurality of holes of at least the second type are located closer to a second end of the plate.

101. (Original) The bone plate of claim 89, wherein the threaded portion of the first type of hole extends through an angle of between about 200° and about 250° with respect to the central axis.

102. (Original) The bone plate of claim 89, wherein: the threaded portion of the first type of hole extends through a first angle at the upper surface; the threaded portion of the first type of hole extends through a second angle at the lower surface; and the first angle is larger than the second angle.

103. (Original) The bone plate of claim 102, wherein the first angle is between about 200° and about 270°, and the second angle is between about 180° and about 2300.

104. (Original) The bone plate of claim 89, wherein the first type of hole has first and second ends spaced apart along the longitudinal axis, and the threaded portion is disposed adjacent one of the ends.

105. (Original) The bone plate of claim 89, wherein the threaded portion of the first type of hole is located closer to a central portion of the bone plate than to an end portion of the bone plate.

106. (Original) The bone plate of claim 89, wherein the first type of hole has a non-threaded portion.

107. (Original) The bone plate of claim 106, wherein at least a portion of the non-threaded portion of the first type of hole tapers inward from the upper surface to the lower surface to form at least one ramp surface for engagement with a screw head.

108. (Original) The bone plate of claim 107, wherein the ramp surface is located on one end of the first type of hole to provide compression in a single direction.

109. (Original) The bone plate of claim 106, wherein the non-threaded portion of the first type of hole is configured and dimensioned to engage a substantially spherical screw head and provide compression of fractured bone fragments.

110. (Original) The bone plate of claim 109, further including a screw having a head, wherein the screw head is substantially smooth.

111. (Original) The bone plate of claim 109, further including a screw having a head, wherein the screw head is at least partially threaded.

112. (Original) The bone plate of claim 106, wherein the non-threaded portion of the first type of hole includes a concave recessed portion in the upper surface.

113. (Original) The bone plate of claim 112, wherein the recessed portion is substantially spherical.

114. (Original) The bone plate of claim 89, wherein: the first type of hole has a first dimension on the lower surface that is substantially parallel to the longitudinal axis; the first type of hole has a second dimension on the lower surface that is substantially perpendicular to the longitudinal axis; and the first dimension is between 1.1 and 3 times larger than the second dimension.

115. (Original) A bone plate having a longitudinal axis and comprising:

- an upper surface;

- a lower surface; and

- at least one first type of hole, the first type of hole being elongated and extending through the upper and lower surfaces, and having a central axis and a longitudinal axis, wherein the first type of hole is at least partially threaded and the threaded portion of the hole tapers inward with respect to the central axis; and

- at least a second type of hole extending through the upper and lower surfaces, wherein the second type of hole is substantially non-threaded.

116. (Original) The bone plate of claim 115, wherein the plate comprises a plurality of holes of the first type and a plurality of holes of the second type.

117. (Original) The bone plate of claim 116, wherein the plurality of holes of the first type are located closer to a first end of the plate and the plurality of holes of the second type are located closer to a second end of the plate.

118. (Original) The bone plate of claim 115, wherein the longitudinal axis of at least one of the first type of hole is substantially aligned with the longitudinal axis of the plate.

119. (Original) The bone plate of claim 115, wherein the second type of hole has an outer perimeter that is substantially circular.

120. (Original) The bone plate of claim 119, wherein the second type of hole is conically tapered inward from the upper surface towards the lower surface of the plate.

121. (Original) The bone plate of claim 120, wherein the second type of hole conically tapers at a cone angle of between about 5° and about 20°.

122. (Original) The bone plate of claim 121, further comprising at least a third type of hole extending through the upper and lower surfaces, wherein the third type of hole includes an internal thread configured and dimensioned for engaging a threaded portion of a screw head.

123. (Original) The bone plate of claim 122, wherein a plurality of holes of the first type and at

least one hole of the second type or third type is located closer to a first end of the plate and a plurality of holes of at least the third type are located closer to a second end of the plate.

124. (Original) The bone plate of claim 119, wherein the second type of hole has a first opening on the upper surface of the bone plate and a second opening on the bottom surface of the bone plate, and the first and second openings have substantially the same dimensions.

125. (Original) The bone plate of claim 124, further comprising at least a third type of hole extending through the upper and lower surfaces, wherein the third type of hole includes an internal thread configured and dimensioned for engaging a threaded portion of a screw head.

126. (Original) The bone plate of claim 125, wherein a plurality of holes of the first type and at least one hole of the second type or third type is located closer to a first end of the plate and a plurality of holes of at least the third type are located closer to a second end of the plate.

127. (Original) The bone plate of claim 115, wherein the threaded portion of the first type of hole extends through an angle of between about 200° and about 250° with respect to the central axis.

128. (Original) The bone plate of claim 115, wherein: the threaded portion of the first type of hole extends through a first angle at the upper surface; the threaded portion of the first type of hole extends through a second angle at the lower surface; and the first angle is larger than the second angle.

129. (Original) The bone plate of claim 128, wherein the first angle is between about 200° and

about 270°, and the second angle is between about 180° and about 230°.

130. (Original) The bone plate of claim 115, wherein the first type of hole has first and second ends spaced apart along the longitudinal axis, and the threaded portion is disposed adjacent one of the ends.

131. (Original) The bone plate of claim 115, wherein the threaded portion of the first type of hole is located closer to a central portion of the bone plate than to an end portion of the bone plate.

132. (Original) The bone plate of claim 115, wherein the first type of hole has a non-threaded portion.

133. (Original) The bone plate of claim 132, wherein at least a portion of the non-threaded portion of the first type of hole tapers inward from the upper surface to the lower surface to form at least one ramp surface for engagement with a screw head.

134. (Original) The bone plate of claim 133, wherein the ramp surface is located on one end of the first type of hole to provide compression in a single direction.

135. (Original) The bone plate of claim 132, wherein the non-threaded portion of the first type of hole is configured and dimensioned to engage a substantially spherical screw head and provide compression of fractured bone fragments.

136. (Original) The bone plate of claim 135, further including a screw having a head, wherein the

screw head is substantially smooth.

137. (Original) The bone plate of claim 135, further including a screw having a head, wherein the screw head is at least partially threaded.

138. (Original) The bone plate of claim 132, wherein the non-threaded portion of the first type of hole includes a concave recessed portion in the upper surface.

139. (Original) The bone plate of claim 138, wherein the recessed portion is substantially spherical.

140. (Original) The bone plate of claim 115, wherein: the first type of hole has a first dimension on the lower surface that is substantially parallel to the longitudinal axis; the first type of hole has a second dimension on the lower surface that is substantially perpendicular to the longitudinal axis; and the first dimension is between 1.1 and 3 times larger than the second dimension.

141. (Original) A bone plate having a longitudinal axis and comprising:

an upper surface;

a lower surface;

at least one first type of hole extending through the upper and lower surfaces, and having a first central axis and being elongated in a direction substantially aligned with the longitudinal axis, wherein the first type of hole is non-threaded and has an outer perimeter, at least a portion of the outer perimeter tapering inward from the upper surface to the lower surface to form at least one ramp surface for engagement with a first screw head; and

at least a second type of elongated hole extending through the upper and lower surfaces, the second type of hole having a second central axis and a longitudinal axis, wherein the hole is at least partially threaded and the threaded portion of the hole tapers inward with respect to the second central axis.

142. (Original) The bone plate of claim 141, wherein the plate comprises a plurality of holes of the first type and a plurality of holes of the second type.

143. (Original) The bone plate of claim 141, wherein the longitudinal axis of the second type of hole is substantially aligned with the longitudinal axis of the plate.

144. (Original) The bone plate of claim 141, further comprising at least a third type of hole extending through the upper and lower surfaces, wherein the third type of hole is substantially non-threaded.

145. (Original) The bone plate of claim 144, wherein a plurality of holes of the first type and at least one hole of the second type or third type is located closer to a first end of the plate and a plurality of holes of at least the second type are located closer to a second end of the plate.

146. (Original) The bone plate of claim 141, further comprising at least a third type of hole extending through the upper and lower surfaces, wherein the third type of hole includes an internal thread configured and dimensioned for engaging a threaded portion of a screw head.

147. (Original) The bone plate of claim 146, wherein a plurality of holes of the first type and at

least one hole of the second type or third type is located closer to a first end of the plate and a plurality of holes of at least the third type are located closer to a second end of the plate.

148. (Original) The bone plate of claim 141, wherein the threaded portion of the second type of hole extends through an angle of between about 200° and about 250° with respect to the central axis.

149. (Original) The bone plate of claim 141, wherein: the threaded portion of the second type of hole extends through a first angle at the upper surface; the threaded portion of the second type of hole extends through a second angle at the lower surface; and the first angle is larger than the second angle.

150. (Original) The bone plate of claim 149, wherein the first angle is between about 200° and about 270°, and the second angle is between about 180° and about 230°.

151. (Original) The bone plate of claim 141, wherein the second type of hole has first and second ends spaced apart along the longitudinal axis, and the threaded portion is disposed adjacent one of the ends.

152. (Original) The bone plate of claim 141, wherein the threaded portion of the second type of hole is located closer to a central portion of the bone plate than to an end portion of the bone plate.

153. (Original) The bone plate of claim 141, wherein the second type of hole has a non-threaded

portion.

154. (Original) The bone plate of claim 141, wherein at least a portion of the non-threaded portion of the second type of hole tapers inward from the upper surface to the lower surface to form at least one ramp surface for engagement with a screw head.

155. (Original) The bone plate of claim 154, wherein the ramp surface is located on one end of the second type of hole to provide compression in a single direction.

156. (Original) The bone plate of claim 153, wherein the non-threaded portion of the second type of hole is configured and dimensioned to engage a substantially spherical screw head and provide compression of fractured bone fragments.

157. (Original) The bone plate of claim 156, further including a screw having a head, wherein the screw head is substantially smooth.

158. (Original) The bone plate of claim 156, further including a screw having a head, wherein the screw head is at least partially threaded.

159. (Original) The bone plate of claim 153, wherein the non-threaded portion of the second type of hole includes a concave recessed portion in the upper surface.

160. (Original) The bone plate of claim 159, wherein the recessed portion is substantially spherical.

161. (Original) The bone plate of claim 141, wherein: the second type of hole has a first dimension on the lower surface that is substantially parallel to the longitudinal axis; the second type of hole has a second dimension on the lower surface that is substantially perpendicular to the longitudinal axis; and the first dimension is between 1.1 and 3 times larger than the second dimension.

162. (Original) The bone plate of claim 141, wherein the threaded portion of the second type of hole conically tapers at a cone angle of between about 5° and about 20°.

163. (Original) The bone plate of claim 141, wherein the first central axis of the first type of hole is located closer to a first end of the bone plate and the second central axis of the second type of hole is located closer to a second end of the bone plate.

164. (Withdrawn) A bone plate defining a longitudinal axis and comprising:

an upper surface;

a lower surface;

at least one first type of hole, the first type of hole being elongated and extending through the upper and lower surfaces, and defining a central axis and a longitudinal axis, wherein the first type of hole is non-threaded and defines an outer perimeter, at least a portion of the outer perimeter tapering inward from the upper surface to the lower surface to form at least one ramp surface for engagement with a first screw head; and

at least a second type of hole extending through the upper and lower surfaces, wherein the second type of hole is substantially non-threaded.

165. (Withdrawn) The bone plate of claim 164, wherein the plate comprises a plurality of holes of the first type and a plurality of holes of the second type.

166. (Withdrawn) The bone plate of claim 165, wherein the plurality of holes of the first type are located closer to a first end of the plate and the plurality of holes of the second type are located closer to a second end of the plate.

167. (Withdrawn) The bone plate of claim 164, wherein the longitudinal axis of the first type of hole is substantially aligned with the longitudinal axis of the plate.

168. (Withdrawn) The bone plate of claim 164, wherein the second type of hole defines an outer perimeter that is substantially circular.

169. (Withdrawn) The bone plate of claim 168, wherein the ramp surface is located on one end of the elongated first type of hole to provide compression in a single direction.

170. (Withdrawn) The bone plate of claim 168, wherein the second type of hole is conically tapered inward from the upper surface towards the lower surface of the plate.

171. (Withdrawn) The bone plate of claim 170, wherein the second type of hole conically tapers at a cone angle of between about 5° and about 20°.

172. (Withdrawn) The bone plate of claim 170, further comprising at least a third type of hole

extending through the upper and lower surfaces, wherein the third type of hole includes an internal thread configured and dimensioned for engaging a threaded portion of a screw head.

173. (Withdrawn) The bone plate of claim 172, wherein a plurality of holes of the first type and at least one hole of the second type or third type is located closer to a first end of the plate and a plurality of holes of at least the third type are located closer to a second end of the plate.

174. (Withdrawn) The bone plate of claim 168, wherein the second type of hole defines a first opening on the upper surface of the bone plate and a second opening on the bottom surface of the bone plate, and the first and second openings have substantially the same dimensions.

175. (Withdrawn) The bone plate of claim 174, further comprising at least a third type of hole extending through the upper and lower surfaces, wherein the third type of hole includes an internal thread configured and dimensioned for engaging a threaded portion of a screw head.

176. (Withdrawn) The bone plate of claim 175, wherein a plurality of holes of the first type and at least one hole of the second type or third type is located closer to a first end of the plate and a plurality of holes of at least the third type are located closer to a second end of the plate.

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EVIDENCE APPENDIX

No evidence has been entered or relied upon in the present appeal.

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RELATED PROCEEDING APPENDIX

No decisions have been rendered regarding the present appeal or any proceedings related thereto.